

### ABSTRACT OF THE DISCLOSURE

A diagnostic system and method for enabling multistage decision optimization in aircraft preflight dispatch. The diagnostic system includes an interface for receiving one or more inputs relating to one or more observed symptoms indicative of a failed component in an aircraft. The diagnostic system extends an entropy-based value of information (VOI) diagnostic model by adding an explicit value function into the VOI diagnostic model to accommodate various variables associated with the aircraft preflight dispatch problem. The construction of the entropy-based VOI diagnostic model and thus the extended VOI diagnostic model are both based upon at least one of systemic information relating to aircraft components and input-output relationships of the aircraft components, experience-based information relating to direct relationships between aircraft component failures and observed symptoms, and factual information relating to aircraft component reliability.